Proprietary Digital Rights Management Systems and Music-Downloads

Obstacles for Innovation from a Competition Policy Perspective

by

Georg Erber

July 2007

Abstract:
The paper addresses the topic of DRMS with regard to the current situation in the music download market. DRMS were made obligatory by licensing contracts to companies in the music download business in particular of the four major music labels, EMI, Sony BMG, Universal and Warner. Fear of extensive pirating of music prevented these major labels from offering more liberal DRMS or copy protection free downloads. However, due to the lack of a common DRM-standard this development lead to substantial fragmentation of the market. Many companies, like Apple with their iTunes and iPod product bundles, developed a proprietary DRMS like FairPlay. Due to an attractive business model of comparatively low prices per track and a huge variety of titles of about five million tracks, Apple managed to obtain a dominant market position for music downloads. However, Apple was unwilling to license its DRMS to other companies or making it interoperable to their particular proprietary DRMS. This caused opposition from competing companies as unfair barriers to market access. Furthermore consumer protection organization challenged the proprietary DRMS due to the unfair restrictions imposed on the consumers. In Europe a couple of countries therefore challenged Apple for their unfair trade practices and initiated legal actions. High market concentration and vertical integration between music download websites and multimedia players are leading to unwarranted barriers of entry from a competition policy perspective. Therefore, the paper analyses this case study of applied DRMS in the music industry from the perspective of competition policy and anti-trust. Using Coase-theorem as a normative principle for the least interventionist approach to regulate music download markets to increase overall social welfare it concludes to certain policy recommendation how to regulate the music download industry.

JEL: O34, L44. L86
Key words: Copyright, DRMS, competition policy, Coase theorem

Dr. Georg Erber, Berlin, Emdener Str. 27, 10551 Berlin, e-mail: Georg-Erber@hotmail.de

Proprietary Digital Rights Management Systems and Music-Downloads

Obstacles for Innovation from a Competition Policy Perspective

by

Georg Erber

July 2007

1. Introduction

Digital rights management (DRM) has been considered as a convenient remedy against violations of intellectual property rights (IPRs) and copyright in particular. The rapid evolution of the broadband internet together with a couple of other enabling technologies made it highly attractive to download music files. At first the innovation was driven by non-commercial or semi-commercial business models where peer-to-peer file sharing software did not include DRM as a barrier to disseminate seamlessly music files.

More recently commercial music downloads have taken off in particular after Apple managed to supply an integrated value chain for music downloads with the iTunes/iPod-bundle. An important element for its success was on the supply side the negotiated consent between Apple and the four key music publishers who dominate the global music industry to obtain licenses from them. On the demand-side the convenience and strong marketing of the iPod/iTunes-bundle attracted a large customer base which was locked-in into the Apple-system by FairPlay the proprietary DRMS of Apple.

This caused resistance of competitors on the vertically integrated markets of suppliers of other music download services on the one hand and suppliers of mobile communication devices including mobile phones that they face an unfair barrier to entry to compete with Apple for customers. Competition authorities of the EU and member countries in

particular together with consumer protection organization started as well to challenge the proprietary DRMS of Apple as a violation of fair competition rules and consumer rights.[1]

Apple fought back against already ongoing or potential court cases by offering the possibility to sell music files without copyright protection via FairPlay if customers are willing to pay for it a higher price.

The present paper find support for this strategy from the perspective of Coase theorem to find ways to negotiate contracts between market participants without state intervention to compensate for unwarranted external effects (potential copyright violations) through price discrimination between copyright protected music files via proprietary DRMS like FairPlay and unprotected files. Due to this strategy unnecessary intervention of competition authorities could be avoided and still efficient free market solutions developed by the different agents in the music download market.

Using Coase theorem[2] as a normative principle[3] to derive guidelines for designing a market order able to deal with this highly innovative environment in a way to lower transactions costs and state intervention by forbearance for such situation where Coase theorem will hold at least approximately, the high-growth dynamics of such markets like music downloads can flourish under a flexible regulatory regime. This takes care of the high uncertainty about the rapidly changing competitive environment of dynamic competition through disruptive innovations in particular.

In the following three sections of the paper in section 2 a brief survey of the recent developments in the global music download market is give, in section 3 the theoretical framework of markets and institutions from the perspective of economic and legal theory with special reference towards Coase theorem is presented, and finally section 4 concludes

[1] See e.g. Schmidt, C. (2006), Das Spannungsverhältnis zwischen Urheberrecht und Wettbewerbspolitik – Ein Überblick, (The Tension between Intellectula Property Rights and Competition Policy – A Survey), Phillips-Universität-Marburg, paper presented at the Walter-Eucken-Workshop, Freiburg 3. 6.-11.2006. (in German)

[2] See e.g. Farrell, J. (1987), Information and Coase Theorem, in: The Journal of Economic Perspectives, Vol. 1, No. 2 (Autumn, 1987), pp. 113-129, Anderlini, l., Felli, L. (2001), Transaction Costs and the Robustness of the Coase Theorem, Department of Economics, University of Pennsylvania, January 2001, (mimeographed)

[3] This is a different perspective as that taken by Acemoglo, D. (2003), Why Not A Political Coiase Theorem? Social Conflict, Commitment and Politics, Running Head: Political Coase Theorem, Department of Economics, MIT,Cambri **Joseph Farrell**

The Journal of Economic Perspectives, Vol. 1, No. 2 (Autumn, 1987), pp. 113-129

dge; Massachusetts, August 11, 2003 (mimeographed). Acemoglo's approach is reaching further to explain the actual outcomes of the political process. However, the view presented here is in line with his by taking Coase theorem not only as a positive economics statement but considers its normative dimension.

on the consequences and remedies to obtain a highly efficient innovative market system based on principles consistent with Coase theorem.

2. Music-Downloads and Copyright Protection

Music-downloads are a relative recent development in the history of the Internet which rested on five key drivers.

- affordable broadband access
- a universal high-quality audio compression standard like MP3 without any copy protection or digital rights management
- peer-to-peer exchange (P2P) software like Napster
- usability of software to rip audio-CDs and share MP3-files by an intuitive user interface to search for music titles from other members of the P2P-community
- huge storage capacities by the Gbytes on consumer devices at steadily diminishing prices

Firstly, music-Downloads have become one of the most popular activities of the Internet in particular after broadband access became affordable for most people over the last years. After a flat rate pricing offered by Internet Service Providers (ISPs) hit the broadband market permanent broadband access to the Internet made it unnecessary to worry about time and money spent for downloading files in the 5 to 10 MBytes for a single song or album, transaction costs for music downloads have been diminishing rapidly depending on the monthly flat rate fee to get access.

Secondly, the invention of the MP3-Format was another trigger which made it possible by compression technologies to keep most of the audio-quality of the usual WAV-Format used before.[4] The German Fraunhofer Institute IIS[5] was developing the MP3-format without a particular commercialisation strategy beside selling MP3-licenses at low costs to anybody interested to get one.[6] MP3 was not initially intended to be used on the Internet and excluded copy protection or DRM. By this the standard became highly attractive for

[4] To convert the CD-Formats a so called Ripper-Software was needed which could copy the CD-Audio-data into a loss less Format like WAV which however, was significantly larger by a factor of about 10 than MP3-encoded audio-files.

[5] see the Website of Fraunhofer Institute for Integrated Circuits (IIS) http://www.iis.fraunhofer.de/EN/bf/amm/index.jsp .and the history of MP3-development at http://www.iis.fraunhofer.de/EN/bf/amm/mp3history/mp3history01.jsp

[6] see licensing conditions published on the Website of the IIS http://www.mp3licensing.com/ .

most hardware and software developers and emerged as a de facto industry standard for digital-audio-files.

Thirdly, the development of P2P-software like Napster made it possible to share files of any kind including MP3s between a huge community of Internet users. Since the software were offered free of charge, sharing MP3-audio-files via a global community of Napster users having access to broadband offered a free lunch for those participating in such a sharing network.

Fourthly, usability of software for ripping and sharing was essential to attract a large crowd of people to participate in these file-sharing-networks. Embodied search engines in P2P-programs to search for music titles available in the P2P-network were another crucial element in the convenience to disseminate MP3-music-files everywhere.

Fifthly, small storage devices capable of storing Gbytes of information like hard disks or flash rams at steadily diminishing prices made it possible to keep large music archives or use writable CD- or DVD-drives to keep them there permanently. Furthermore the writable CDs and DVDs had to become cheap enough to compete with the traditional read-only CDs and DVDs sold in the usual media stores and shops.

The new highly innovative supply chain of free audio content over the broadband Internet caught the music industry rather unexpectedly. These different innovations took place independently from each other and combined more accidentally into the popular music download application. The innovation emerged as an emergent process where supplies of different elements of the supply chain did not have the final outcome in mind.

Only after they realized that this new distribution channel of audio content attracted rapidly larger and larger crowds of their traditional customers young people in particular, they were looking for legal action to protect their ownership rights against this new kind of music piracy.

They hastily took legal action to closedown Napster and other rather rapidly upcoming new P2P-software solutions like Kazaa, eDonkey or BitTorrent.[7] Others like Bertelsmann Music Group (BMG) tried to transform Napster into a legal music download service. To stop Napster to operate already became a difficult legal issue since copyright laws were

[7] See e.g. Röttgers, J. (2003), Mix, Burn & R.I.P., Das Ende der Musikindustrie (The end of the usic industry), Heise, Hannover. Chap. 1 and 2.

not prepared to deal with this new disruptive invention[8], which - with regard to illegal distribution of copyright protected audio-files - had now business model at all. This was not surprising because Shawn Fanning the creator of Napster was part of the hacker community which used the Internet as their juvenile playground. It were these youngsters who playfully used the Internet as a platform for developing solutions suitable for their individual purposes without caring for personal profits and furthermore who wanted to use the Internet as a platform for social networking which finally dramatically undercut the traditional music industries business model. The reaction of the industry was primarily defensive by fighting against this innovation legally.

Due to limits to get access to otherwise anonymous violators of copyright, only Napster could be effectively taken to court, but it needed creative judges to find a way to make the owner of the Napster-software liable for the harmful illegal distribution of audio-content via their P2P-software.[9] Even worse the inventor of Napster could not pay music publishers the foregone profits even he was committed guilty by the courts. It therefore needed more intrigue legal constructs to fine BMG who had lend support and money to Napster to use it as their own music-download distribution channel.

Since the legal foundation of the copyright law applicable to the free music-download phenomenon was rather weak, other new P2P-software developers rapidly developed P2P-software versions which made it even more and more difficult to get control over the file-sharing system from a single server. This put the music industry in the position of the hare in the fable who wanted to run faster as two hedgehogs. Always when the music industry thought they had put out one file-sharing-system and won the finally battle another one was springing up near by.

It took them at least until 2005 to win the currently last major court case against BitTorrent the most successful P2P-high-speed-filesharing program.[10] Since then illegal file downloads via P2P-file-sharing have peaked and are declining in importance.

According to the most recent available International Federation of the Phonographic Industry (IFPI) Piracy Report 2006[11] states:

---

[8] Christensen, C. M (1997), The Innovator's Dilemma, Harvard Business School, Cambridge, Massachusetts, reprinted as paperback by Harper Collins, New York in 2000.
[9] BBC-New, Napster rivals celebrate ruling, 13 February, 2001, http://news.bbc.co.uk/1/hi/business/1167508.stm
[10] See e.g. Digital-lifestyle, MPAA Wins Court Case Against BitTorrent Site, LokiTorrent, posted Mike Slocombe on 11 February 2005, http://digital-lifestyles.info/2005/02/11/mpaa-wins-court-case-against-bittorrent-site-lokitorrent.
[11] IFPI: The Recording Industry Piracy Report 2006, Protecting Creativity in Music, July 2006.

"IFPI estimates that almost 20 billion songs were illegally downloaded in 2005. This is based on consumer research in 10 music markets (including the US, Germany, UK and Brazil) and third party surveys. While this shows an extremely high piracy rate for online music, it also illustrates the vast potential for legal digital music. Record company revenues from digital music tripled in 2005 to US$ 1.1 billion and have continued to grow strongly in 2006." p.4

Besides legally fighting illegal distribution of music-files via the Internet the music industry is well aware of the attractive properties of the Internet to distribute legally music-audio-content. According to IFPI online music-download sales reached globally 2 bill. US Dollars. This was twice as much as the year before.[12]

Music-downloads therefore already reached 10% of the turn over of the global phonographic industry. IFPI expects that by 2010 this share could become 25%. On the long-run music-downloads or streaming music-audio could substitute most of the current phonographic market of traditional audio CDs or DVDs.

It was Apple who took advantage in 2001 of the failure of the four large music publishers Universal Music, Sony Bertelsmann, Warner Music and EMI to develop their own consistent business model for music downloads and fighting instead legal quarrels against P2P-software-suppliers.

By offering a whole innovative seamless supply chain for legal music downloads competitive to the illegal ones instead of trying to sell only single elements of it by different suppliers, Apple managed to take the music-download market by storm when offering this new kind of integrated service in January 2001. The customer-oriented music-download-Web-service of Apples iTune-iPod-bundle became highly superior to other more piecemeal offerings. In 2005 Apple still managed to keep over 70%[13] of the world market share for music downloads in a rapidly growing music-download market. In 2006 Apple sold 46 million iPods. However, competition is becoming more intense since then and Apple is losing gradually some of its market share.[14]

The key ingredients for Apples success with the iTunes-iPod-bundle were:

[12] IFIP: Digital Music Report 2007, January 2007. p. 3.
[13] This number has become highly controversial because excluding numbers from developing countries in particular in Asia led to a complete different estimate of 12.9% in 2006. See e.g. Communities Dominate Blog: Picture tells it better, (part 2) - iPod global market share 12.9% at EOY 2006 posted by Thomi T. Ahonen and Alan Moore on 18. January 2007 http://communities-dominate.blogs.com/brands/2007/01/picture_tells_i.html .
[14] See e.g. Communities Dominate Blog: Requiem for a Heavyweight: iPod reign is utterly over posted by Thomi T. Ahonen and Alan Moore on 17. January 2007 http://communities-dominate.blogs.com/brands/2007/01/requiem_for_a_h.html .

- License agreements from all big four music publishers for legal music downloads to offer a huge number of titles (currently Apple claims to offer five million tracks). By this huge variety the possibility one-stop-music-download-shopping for most of the available music tracks becomes possible.
- an Internet-platform like iTunes, Apples music store, to sell in a convenient manner audio-content bundles with other services like Podcasting,
- reasonable prices (99 Cents in the US and 99 Cents in Europe per single song) for download music consistent with the willingness to pay of the majority of customers to obtain legal access to music,
- a music-player like the iPod or the just in the US released iPhone to offer ubiquitous access to a large stock of music due to sufficient storage (ranging currently from 1 to 80 Gbytes equivalent to 300 to about 25.000 songs).
- enhanced usability of a music-player by introducing e.g. play lists or search functions, linked archive-services including artists and song and album titles, joggle-technology,
- strong global marketing power to get awareness of potential customers for the products and services.

One key element for getting license agreements from the big four music publishes[15] Apple had to accept that they will protect audio-files by a digital rights management system (DRMS) which blocks illegal copying by technical copy protection measures. For this purpose Apple developed a proprietary DRMS named FairPlay. Similar to the P2P-sofware-suppliers Apple had to accept liability for all violations caused by failure of Apples supply chain to protect music-files properly for the music publishers.

This has become a major obstacle since then, because of these liability rules Apple rejected requests of other music-download and proprietary DRMS-suppliers to make FairPlay protected files interoperable with other music-download services. Especially the successful hacks of the FairPlay DRMS made Apple more cautious to keep interoperability to other DRMS. Attempts to get Apple on board of a consortium which is trying to make all proprietary DRMS interoperable have not been successful.[16]

[15] In 2005 the big four controlled 71,7% of the global music market.

[16] See Coral Consortium: Coral Consortium Letter to Steve Jobs send and published on 9. February 2007.

This even led to legal quarrels including competition policy authorities at the national and the EU-level in particular (for more details on this topic see section 3.2.2 of this paper).

Facing significant fines and rulings by competition authorities in Europe to open Apples DRMS for other competitors, Steve Jobs CEO of Apple made the suggestion to give up obligatory copy protection for music files.[17] Other prominent leaders of the industry like Bill Gates[18] of Microsoft, Rob Glaser[19] of Real Networks or Timothy Berners-Lee[20] considered DRM in its current state an impediment for future rapid development of the Internet. Their key argument was that the current situation of multiple proprietary DRMS has become a severe impediment to the further innovation process of the Internet business.

Currently Apple is trying to repeat its past success story with the release of the iPhone extending the reach of the music-download-market towards the global mobile phones market. Mobile phones now will reach this year 2 billion customers. This exceeds the music-player market significantly. Of one billion mobile handsets expected to be shipped in 2007, almost half of them will be MP3- enabled. This offers a huge market potential for all players in the supply-chain. Implementing different DRMS on all these devices and maintain interoperability and compatibility to earlier version under rapid technical progress could become another nightmare for the industry which already has to struggle with security loop holes in the operating systems and middleware like browsers.

It seems likely that the mobile music player market will be absorbed to a significant extent by mobile music phones. The latter sales numbers grew in 2006 by 243% reaching 309 millions. Multiple proprietary DRMS and missing interoperability of copy-protected music files in this high-growth environment would become a major obstacle as it is currently the state. Most of them have no DRM or even multiple proprietary DRMS implemented in their architecture. Without such DRMS access to commercial music-download-sites like iTunes would be impossible. Overcoming the deadlock in the whole music-download industry, however, seems in the short-run quite unlikely. One quick way out of the current troubles would therefore be to give up at least partially DRMS at the current situation and sell DRM-free music-files at a moderate higher price because otherwise the rapid growth of business would stall.

---

[17] Steve Jobs: *Thoughts on Music*, 6. Februar 2007 http://www.apple.com/hotnews/thoughtsonmusic/

[18] TechCrunch: *Bill Gates On the Future of DRM*, posted by Michael Arrington 14. December 2006. http://www.techcrunch.com/2006/12/14/bill-gates-on-the-future-of-drm/ .

[19] The Register: *For Real, DRM no cure for music biz blues*, posted by Andrew Orlowski, 27. January 2007.

[20] Timothy Berners-Lee: Testimony at the Hearing on the "Digital Future of the United States: Part I -- The Future of the World Wide Web", United States House of Representatives, Committee on Energy and Commerce, Subcommittee on Telecommunications and the Internet, 1. März 2007, Washington D.C.

3. Markets and Institutions

Markets are social institutions were according to general exchange rules people exchange goods and services freely. To make markets work efficiently they are supported by a particular market order which sometimes is set-up spontaneously by the community of actors in a form of self-organization or the rules are codified by general laws and protected by the state after a lengthy consensus building process between legislators.

The legal system of contract laws were all buyers and sellers are free to make any contracts between each other obeying the general order of commercial laws is an important element for an effective market mechanism to enhance the welfare of all participants. It has gradually emerged out of different historical developments country by country which under steadily changing conditions regularly needs adjustments and revision to make it suitable for the present or future market conditions. In a borderless world of the Internet this heterogeneity of legal systems make it even more difficult to enforce intellectual property rights (IPRs) as copyright across these legal systems and in particular to enforce prosecution efficiently. Many illegal music-download sites are outside the jurisdiction of the countries where the copyright owners reside. If governments like e.g. in Russia or China are reluctant to enforce copyright violations it becomes impossible to close down those sites by legal action. As long as there are no legal and technical barriers present in the Internet to deny anybody access to such sites the legal framework becomes ineffective.

Music stored as digitally audio files is from its very nature a non-rival commodity. As the illegal distribution of MP3-files via P2P-networks demonstrates dramatically, if transactions costs due to ubiquitous free access are negligible, there is significant high demand for the seemingly free good. DRMS are just a mean to make intrinsically non-rival goods like music-files into one which are restricted in its usage to only those who have obtained legal rights to use it.

However, as industrial organization literature analysing the possible outcomes in such market environments illustrate there is not unlimited demand to drive out legal distribution of music completely. People have willingness-to-pay for legal copies of music files opposite to illegal one.[21] Since the multitude of models studied in great detail in

[21] Theoretical and empirical analysis based on industrial economics model give evidence that because of the credibility of the legal system to prosecute the violation of legal copyright laws and the risk associated by becoming caught are sufficient barriers to the majority of people to refrain from illegal copying to a significant extent. However, the price setting behaviour of suppliers to be considered as a fair price, plays as well a crucial role to commit to legal music-download services. See e.g. Cheng, H. K., Sims, R., Teegen, H., To Purchase or to

general gave this overall conclusion, the success or failure of a legal system to protect copyrights properly depends to the appropriate balance between commercial desires to maximize profits one the one hand, and on the other, on the willingness-to-accept and willingness-to-pay of the potential customers. Therefore owners of copyright protected music files have to consider carefully their business model in particular to price setting. However, this is common practice in any market, where prices become excessively high, give room for all kinds of illegal bypass supply chains by creating black markets.[22]

Drug markets for heroin or marihuana work in a similar fashion from the perspective of economic theories of crime. Milton Friedman[23] therefore felt that introducing legal dug markets would drain the illegal ones rapidly because most customers value legal behaviour sufficiently high to switch from illegal distribution channels toward legal ones. Therefore illegal markets could always be considered as signals of significant market failures of legal markets.[24]

If there is demand but no legal supply the opportunity for those offering products and services illegally opens up. The bigger the markets and profits earned the larger the market failure in legal markets.[25] High profitability of illegal supplies is the strongest incentive for rational criminals to become risk-takers even if legal punishment by the state is codified in criminal law. The foundations are willingness-to-pay on the one hand and on the other hand in the music copyright violation case the distribution of music files at supply costs close to zero. Furthermore group size of those who ware willing to violate copyrights on the supply and demand side would become criminals under a respective legal framework could create a severe enforcement obstacle. It is unwarranted to criminalize large groups in the population by over protective laws.

Pirate Software: An Empirical Study, in: *Journal of Management Information Systems* (1997) 13, 49-60, Liebowitz: *Policing Pirates in the Networked Age*, Cato Institute, 2002, p. 28 ff., K.-L. Hui, Png, I.: *Piracy and the Legitimate Demand for Recorded Music*, 2002 A. Katz: *A Network Effects Perspective on Software Piracy*, 2003. Marc, Fetscherin: *Investigating Movie Piracy on Peer-to-Peer Networks*, 8th Annual CTI Conference - Copyright and software patents, Copenhagen 2003. Arun Sundararajan: Managing Digital Piracy: Pricing and Protection, In: *Information Systems Research*, 2004, Vol. 15(3), 287-308.

[22] See e.g. http://www.auburn.edu/~johnspm/gloss/black_market .

[23] See the Interview of Randy paige with Milton Friedman on the Drug War, Schaffers Library on Drug Policy, Excert taken from Friedman & Szasz On Liberty and Drugs.The interview is from 1991 on "America's Drug Forum. http://www.druglibrary.org/schaffer/Misc/friedm1.htm . For an empirical analysis of drug markets see also Levitt, S. D., Dubner, S. J. (2005), Freakonomics A Rogue Economist Explores the Hidden Side of Everything; B&T (Mai 2005), Levitt, S. D: (1995), Why Do Increased Arrest Rates Appear to Reduce Crime: Deterrence, Incapacitation, or Measurement Error?, NBER Working Papers 5268, National Bureau of Economic Research,

[24] See e.g. Becker. G. S. (1968), Crime and Punishment: An Economic Approach, in: Journal of Political Economy, 76(2), 169-217; Stigler. G. (1970), Optimal Enforcement of Laws, in: Journal of Political Economy, 526-536.

[25] Erling E.; Aasness; J., Skjerpen, T., Myers, Jr., S. L. (1995), Economics of Crime: Deterrence and the Rational Offender. in: *Journal of Economic Literature*, 33(4), 2008-2010.

As the history of prohibition of alcohol in the US in the 1920s have illustrated, the respective prohibition laws created large scale organized crime and across all social groupings a willingness to ignore prohibition laws. Finally due to this failure to accomplish the desired effects, i.e. better the people to give up alcohol and fight alcoholism, the prohibition laws gave way to rapid growth of organized crime and a low level of support in the people to accept this law. In the end excessive demands on behavioural changes for a population finally led to a significant loss of legal support in the general public. These unwarranted effects led to the abolishment of prohibition.

3.1 Legal Issues

Legislators therefore have to consider carefully what they are tending to make illegal and prosecute by criminal law. In the current debate on illegal music downloads there is a high risk of overkill if due to bad business models in the legal music-download markets illegal copyright violations become an attractive alternative for a huge number of people.

In particular young people who illegally download and exchange music files in their community should not become used that due to market failures in legal download markets they get used to commit to persistent violating of copyright laws. Youth cultures were persistent copyright violations become common culture is a worst case scenario for the music industry. Since the habits to obey laws are formed at a young age this disobedience towards laws might even prevail in their adult age.

Hardliners from the music industry who would like tough legislation to punish copyright violations base this policy on the empirically unproven assumption that hard punishment will have always a sufficiently high deterrent effect at the end. They ignore that laws are regulations which could only be effective if they are accepted by the vast majority as fair and just. Without this fairness and justness of laws accepted by the majority of the people laws become major obstacles without inducing the desired behaviour. One reason to keep fairuse[26] rights for private copies intact is based on the assumption that otherwise the incentive to violate a too restrictive law would become highly popular across the people.

Punishment as a rational disincentive only works reasonably efficient if there is sufficient moral support by the majority of the people. It is even the foundation for legitimacy of the legislators in a parliamentary democratic system.[27]

[26] See e.g. the Fairuse-website of the Stanford University http://fairuse.stanford.edu/web_resources/index.html .
[27] See e.g. Robson, A. R. W., Skaperdas, S. (2002), Costly Enforecement of Property Rights and the Coase Theorem, Australian National University, Canberra, May 2002, (mimeographed).

Formally the risk of prosecution times the fine of punishment does not generally work as an efficient deterrent. Especially that more drastic punishments and increasing risk of being caught guarantees generally a higher deterrent effect does not hold under all circumstances. Empirical studies do not lend support to this simplistic view of the behavioural foundations of criminal behaviour.

Furthermore the cost of prosecution to raise the risk of prosecution significantly and the social costs of severe punishment for copyright violations would put an excessive burden on the average tax payer. Up to now there is little evidence by court cases in Germany that violations of copyright has led to significant penalties e.g. send people to prisons. This is due to the fact that drastic penalties desired by the music industry are often violating the equivalence principle between crime and punishment in criminal law. Often representatives of the music industry tend to ask for excessive punishments not in line with the common perception of fairness and justness in punishment.

Problems to identify those people who illegal download music files for private and non-commercial usage are only easily identifiable if the privacy of all Internet users is severely damaged. Intrusion into private PCs as part of their private sphere via detection software over the Internet is in stark contrast to the constitutional privacy rights of the home of citizens.

Giving the police or even music companies the general right of access to computers in private homes to spy for illegal copies of music files, is a very strong intrusion in the the privacy sphere of each citizen. Putting these rights at risk without strong suspicion or evidence and without an approval to violate privacy rights by a judge, would fundamentally change the liberal order of our society. In particular the fundamental principle that anybody has to be considered at first not guilty until there is significant proof that he is guilty of a certain crime is a fundamental roadblock to protect citizens against unjust treatment by others. Currently even the problem to fight against Islamic terrorist attacks by searching computers connected to the Internet at home does not find general political support in Germany and is highly controversial in the public political debate. How much more the attempt to use spyware to detect violators of copyright by illegal music downloads will face public resistance?

Instead of fighting single minded the symptoms, e.g. illegal music downloads by legal action against violators, the more efficient economic approach seems to be to find efficient legal supplies for music downloads which match the needs of customers and

suppliers and compete by this successfully against illegal suppliers. If there is general agreement by most potential customers that the commercial service offered is reasonably priced and gives the desired service to the customer, a great number of people would switch to this service instead of staying or becoming illegal. The success story of Apple with iTunes gives a good example for this kind of strategy.

3.1.1 Precautionary Principle

The precautionary principle is often a central argument to ask for strong legal action. Because representatives of the music industry expect that a legal music download business model is uncompetitive in principle against illegal supplies without payment, they predict that the music industry would collapse in the near future without strong legal action to drive out illegal copying. These scenarios of future catastrophes of an industry is used as a key arguments for lobbing legislators to take action by drastic criminal laws and legal actions to make prosecution easier as it is now under the current legal system.

Cass R. Sunstein, a prominent law professor at the Law School of the Chicago University has recently published a book[28]on the problematic aspects of the precautionary principle on legislators who use it as key argument to set-up more and more restrictive rules and regulations. In particular in the area of innovations like e.g. the nuclear technology, gene technology or nanotechnology or topics like climate change the precautionary principle plays a very prominent role to constrain development because of their potential harmful consequences. A risk assessment at an early stage of development is often impossible due to lack of knowledge and data in particular. Therefore the precautionary principle is taken as a substitute in the legal argument for a scientific analysis of potential costs and benefits of using and implementing new technologies and innovations.

Since most people are risk averse - especially when the degree of uncertainty cannot be calculated[29] – the precautionary principle is often used as a foundation to justify highly restrictive action.[30]

Risk averseness means that people are willing to forgive benefits or profits respectively even if a rational decision maker taking decisions based on the certainty equivalence principle would be willing to take higher risks for higher expected returns instead. However, the traditional literature of rational choice under risk assumes that risks can be

[28] Cf. Sunstein, C. R. (2005), Laws of Fear. Beyond the Precautionary Principle, University of Chicago, Chicago.
[29] See e.g. Gigerenzer, G. (2002), Calculated Risk, Simon & Schuster, New York.
[30] See e.g. Zivin, J, G. (2003), Risk Aversion, Liabilities Rules and Safety, NBER-WP 9678, National Bureau of Economic Research, Cambridge, Massachusetts, May 2003.

assessed to a satisfying degree so that expected utility calculations can be applied. Even if human behave risk averse the degree of risk awareness could be determined as the degree of deviation from the rational choice decision model and by this become an operational entity. But these kinds of traditional rational choice models often break down completely when the amount of information necessary is unavailable but still a rational decision making is needed.

The precautionary principle therefore is often used as a general clause to hold-up developments if possible by laws because the lack of information makes it seemingly safer to wait until more information is available to make then a better decision according to the rules of general decision making under risk and uncertainty. The forbearance to act now is generally considered to be superior compared to act now under uncertainty.

Sunstein, point out that this kind of reasoning in generally flawed and lacks a solid logical foundation. Under total uncertainty to act or not to act are equivalent best choices. It is common knowledge in game theory that in a prisoner's dilemma a random choice of tossing a coin is a better strategy compared to any preference for one pure strategy according to MiniMax-rule to minimize the maximum loss.

Still most people believe to keep the status quo intact is less risky than testing a new possibility. This conservative bias opposite new opportunity could become a deadly risk if other move forward in their evolution. If the environment is changing the species heed to adjust by co-evolution to survive. If they fail, they might end like the dodo and become extinct.

The precautionary principle as an impediment to systematically legally restrict innovation might just have a similar effect. It tends to restrain developments which if not under total control bypass the legal barriers and make those who believe that they could contain the development by legal action the losers in the end. In a world of global competition but no global legal framework to restrict competitive actions everywhere abroad, successful innovations developing in a less restrictive legal environment will overcome legal barriers sooner or later. Legal IPR-systems are competing with each other in a global economy. Those who offer better chances for more successful innovations tend to drive out

3.1.2 New business models by innovative new supplies of digital music

Considering the situation of the copyright issue in music download markets one gets the impression that the music publishers just fell into the risk averseness trap by trying to keep music-downloads from the public by legal restrictions instead of developing a suitable

business model as Apple did. Using the precautionary principle which often argues with worst case scenarios they tend to impress legislators that highly restrictive copyright laws are the only means to safe the industry from extinction. That this must not be the case and that there are better strategies based in particular on the Longtail-approach[31] of giving a convenient access to the huge variety in stock of the music publishers and creating by this additional demand unsupported by the traditional music stores and shops.

As ring tones for mobile phones e.g. supplied by Jamba in Germany or music podcasts have shown there are completely new ways to sell music and digital audio content on the Internet if it is appropriately customized to particular needs. By more innovation on new ways to use music the possibility of new revenue generating business emerge. Sticking instead on the purely defensive track of defending the traditional business model makes the tradtional music publishers highly vulnerable. The type-font companies like Linetype before laser printers hit the market sold one font by hundreds of dollars. After Apple introduced its first Laserwriter in 1985 with Adobe-Postscript-Fonts, the traditional business model of Linotype for selling fonts at a high margin more or less collapsed rapidly. Today you get hundreds of fonts for free or for a couple of dollars. Copyright protection of fonts did not stop this development. Laserprinter manufacturers bought font companies or obtained cheap licenses to keep the printer market growing. Property rights on fonts could not stop this development in the end. Similar developments might happen for music publishers when they fail to develop business models in the new environment.

3.2 Markets and External Effects

Up to now there is no persistent downward trend that the music industry is on the verge of collapse. Substitution of the distribution of music by selling music-CDs and selling it instead via music-downloads leads in Germany[32] as elsewhere to a decline in the turnover of the industry. There is a significant decline in sales of the industry, but this is not attributable to illegal music downloads alone. Other external factors are influencing the sales and revenues of the industry.

Such factors are:

[31] By Longtail Anderson denotes the empirical observation that there exist tiny niche markets which cannot be served by traditional distribution channels because of their high costs but are at reach in a global Internet world with insignificant transaction costs. See Anderson, Ch. (2006), The Longtail, How Endless Choice is Creating Unlimited Demand, The New Economics of Culture and Commerce, Random House Books, London, UK.

[32] „Downloads-turnover increase by 36%, sales in the distribution of physical copies decline by 3.4% … Download markets enjoys selling 10.2 mill. single tracks and 0.7 mill bundles …" (translated by the author) See Deutsche Phonoverbände: Tonträgermarkt im 1. Halbjahr 2006, press release of 14. August 2006.

- IFPI estimates that about one third of 1.2 bill. Music-CDs and –DVDs sold in 2006 are illegal copies. There exist professional networks e.g. in China which illegal copy any CD or DVD of commercial value at quality levels that are hard to distinguish from legal commercial ones. These are distributed worldwide on the street or on auction sites like Ebay.[33] The turnover realized by these illegal commercial networks is estimated by the IFPI for 2006 to have reached 4.5 bill. US Dollar. These estimates are based on the street prices of the black market.

- There is the possibility of increasing saturation of the music market because people especially when they grow older accumulate over time a large stock of recorded music. Furthermore if people get older they spend on average less time to listen to music. In particular in an aging society it would be unsurprising that there is a declining demand for music.

- The music industry is selling music-CDs and -DVDs at significantly lower prices and in large bundles as in the past and by this cannibalize their profitability. In particular most of these music-CDs are not copy protected so that by buying a CD or DVD one can bypass the DRMS of the download services legally. This opens up the distribution of unprotected music files from such legally bought CDs and DVDs.[34]

3.3 Coase Theoreme

Ronald Coase, 1991 nobel price winner in economics, formulated in 1960 the much quoted Coase-theorem concerning the social costs[35] of externalities on the efficiency of

[33] IFPI: The Recording Industry Piracy Report 2006, Protecting Creativity in Music, July 2006.
[34] The reason for giving-up copy protection for CDs in most cases is that proprietary DRMS on CDs of Sony led to severe problems in the market. Computers could be damaged and become inoperable or these CDs could not be played on CD- or DVD-player who could not handle the DRMS properly.
[35] Coase, R. H. (1960), The Problem of Social Cost, in: *Journal of Law and Economics*. Vol. 3 (1960), 1–44.

markets and possible remedies to deal with them with state intervention by specific regulations.

Coase questioned the common sense of most economists in the Pigouvian tradition that externalities are generally leading to market failure. Market failures were considered the basic precondition for justified state intervention to correct for these externalities through regulation. Coase instead came to a different view on this issue. He made the claim that externalities per se does not automatically lead to market failure. Only if there are significant transaction costs associated with adjustment costs for an externality, i.e. bargaining costs between those who cause a negative externality and those who have to carry the cost of the negative externality the intervention of the state could become necessary. Externalities per se, however, are not sufficient conditions for state interference. If transactions costs are low, i.e. bilateral bargaining about the necessary compensations are obtainable to satisfy both parties, even if externalities exist market can generate efficient solutions.

In a general equilibrium framework with many externalities Ramsey prices[36] are those prices which would compensate all market participants appropriately that nobody has to carry costs unjustly because others obtain a free lunch by passing them over to him. If bargaining would be too costly or due to market power of those who are causing negative externalities on others the state should regulate the market accordingly through taxation by setting tax rates to adjust unregulated market prices to match Ramsey prices. In practice this gives just a reference system because the information and transaction costs to implement such perfect government regulation would be too high.

Another important condition fort he validity of Coase-Theorem that markets are efficient even when externalities are present is that property rights of all market participants are uniquely defined. The specific distribution of property rights between market participants, however, is irrelevant to guarantee the efficiency of the market outcome. Therefore the attempt to use distributional issues as an argument for market efficiency is flawed.

Applying Coase-theorem to the topic of copyright for music-downloads, this would call for legal action of the legislator to define the property rights of suppliers and user or sellers and buyers of digital music files respectively unambiguously. As long as property rights are ill defined bilateral negotiation about them will lead to high transaction costs.

[36] Ramsey, F. (1927), Contribution to the Theory of Taxation, in: *The Economic Journal*, 37(1), March 1927, 47-61. Damus, S. Ramsey pricing and ist applications, http://www.storm.ca/~sdamus/trf1982.htm .

Proprietary DRMS and technical devices to enforce copyright protection being consistent with the legal framework set by the legislator are appropriate means to lower transaction costs. Legal system could enforce property rights efficiently under such circumstance, because the transactions costs are comparatively low. More government intervention to correct the market outcome would be unnecessary.

Proprietary DRMS or copyright protection could, however, on the basis of bilateral negotiations changed, if they cause negative externalities fort he users. If the owner of the property right is appropriately compensated by those who obtain the benefits of removing copyright protection by a payment to compensate for he negative external effects, the outcome would be efficient.[37]

This would be in general the case if by proprietary DRM copy protected music files are sold cheaper as those who are not. This is exactly the strategy Apple has chosen in their pricing scheme. They sell both versions copy protected by Fairplay and unprotected at different prices.[38] By paying a higher price the buyer of unprotected music files get the benefit of being able to use the files on any device regarding the fairuse conditions. By offering the two options the customer can decide which contract suits more his preferences. No one is forces to accept a highly restrictive contract when he would like to use his music files in a more flexible manner as the current proprietary DRMS are able to deliver. Obeying Coase-theorem the solution gives the opportunity for customers to freely choose for themselves the best solution. No state intervention to make obey or the other obligatory is needed.

To take Coase-theorem as a benchmark to create the possibility to establish efficient markets the definition of property rights is the key issue. The current debate world wide how to define them in a fair way without redistributing ownerships rights to the disadvantage of the users the major challenge which leaves both parties unsatisfied, if they tend to shift their property rights from the current status quo to the advantage or disadvantage of the opposite party. Beside the redistribution aspects the even more important issue of copyright reform is to establish clarity about property rights.[39]

---

[37] Such agreements are actually made between representatives of both parties. See e,g. BIEM/IFIP-agreements (BIEM - Bureau International des Sociétés Gérant les Droits d'Enregistrement et de Reproduction Mécanique), who developed standard contracts for licensing between music publishers and music-download service providers, e.g. Apple.

[38] iTunes currently sells FairPlay protected music files at 99 Euro Cent and unprotected music files by 1.29 €.

[39] Defining penalties for copyright infringement has also carefully strike the balance between commensurability of protection of ownership rights and penalties for infringement of copyright. See e.g. Arun Sundararajan: Managing Digital Piracy: Pricing and Protection, In: *Information Systems Research*, 2004, Vol. 15(3), S. 287-

To guarantee the non-discriminatory application of the use of property rights, copy rights in this case respective, at the EU-community level or even better internationally at the level of WIPO there is an urgent need for a unified international common definition of the respective property rights.[40]

Furthermore consumers in the EU-member countries should be opened up the possibility for class-action lawsuits in case that they feel unjustly hindered by proprietary DRMs in the execution of their user-rights.[41] Due to their lower transaction costs for settling a legal dispute the EU-Commission and the German legislator should consider such possibilities. This should not make the right of consumer associations as a particular for of class-action lawsuit obsolete. It would, however, make it easier for minorities to bring their objections to court at low transaction costs.

Coase-theorem could there be used as a normative principle for setting-up a legal framework for an efficient market order in the area for music-downloads by aiming to obtain:

- A lower degree of government intervention in music-download markets.
- Taking the principle of transaction costs reduction as a guiding principle in legislation
- Giving greater clarity about the separability of distributional and allocational efficiency issues, which often are mixed up the pratical policy debate
- Defending the liberal order against excessive and unnecessary state intervention by too much regulatory interference.[42]

From the perspective of Coase-theorem the rapid development of music-downloads via broadband Internet will increase overall social welfare. To make anybody better off an efficient market order is fundamental.

Licensing of music publisher should non-discriminatory with regard to all potential suppliers of music-download-services. This includes the licensing for DRM-free or non-copy-protected downloads under the fairuse regulation.

308, A. Katz: A Network Effects Perspective on Software Piracy, 2003. S. Liebowitz: Policing Pirates in the Networked Age, Cato Institute, 2002, S. 28 ff. or K.-L. Hui, Png, I.: Piracy and the Legitimate Demand for Recorded Music, 2002.

[40] See e.g. the position of the German Federal Ministry of Justice to the EU-Commission Staff Working Document, Study on a Community Initiative on the Cross-Border Collective Management of Copyright, Berlin 20. September 2005.

[41] See the recent newspaper article FTD: Gericht öffnet Tür für Sammelklagen (court opens door for class-action lawsuits), in: *Financial Times Deutschland* 22. February 2007, p. 7.

[42] See e.g. David Campell, Mathias Klaes: The Principle of Institutional Direction: Coase's Regulatory Critique of Intervention, In: *Cambridge Journal of Economics*, Vol 29(2), 2005, 263-288.

Furthermore the obligation to make proprietary DRMS interoperable tends to be another element to establish an efficient market order.

Taking Coase-theorem as a framework to design a market order for digital goods and services where efficient competition is as much as possible all impediments like badly defined property rights and high transaction costs are diminished as far as possible and establishing and maintaining as much as possible free access to all levels of the supply chain, the speed of innovation and through this the overall social welfare would flourish.

On the other hand special interest groups trying to lobby to disable some of the principles outlined by Coase-theorem by respective biased legislation or by intentional violation of the market order principles to obtain unfair privileges could be better rejected by taking reference to the normative framework set by Coase. It would give institutions the right direction urgently needed in the current highly controversial debate.

4. Conclusions

Summing up the consideration given in the paper the key messages are, that Coase theorem could be utilized to derive principles for an efficient market order in the music download market. The aim to enhance the efficiency of highly innovative markets like those in the music download industry which is challenged on the one hand by copyright violations and on the other by attempts of the supply side to restrict the present legal status of fairuse for consumers through de facto barriers via proprietary DRMS not in line with the legal rights consumers.

The second dimension related to proprietary DRMS relates to the artificial barriers of access to customers like of the iPod/iTunes-bundle because through its vertical integration and denial of making its proprietary FairPlay interoperable with other proprietary DRMS tends to restrict competition on the two levels of the value chain, supply of music download services and mobile media players.

The solution offered by Apple to give consumers free choice to buy protect and unprotected music files is an elegant solution which could be based on Coase theorem. Instead of forcing suppliers like Apple by legal action of the competition authority to make their DRMS interoperable or even exclude the company from particular national markets, the offered solution internalizes the unwarranted negative externalities via a price discrimination mechanism. Those willing to stay in a proprietary DRMS world of Apple or other suppliers are compensated by lower prices. Those who need or want more copyrights in line with fairuse to transfer music files towards all devices in their household can obtain a legal

unprotected music file and therefore forgo the risk of being prosecuted because of violations of the copyright laws.

Finally the vertical integration of the iTunes/iPod-bundle is at least weakened sufficiently to make the currently superior market position contestable. If this business model will become common practice for most other suppliers the competition between two alternative business models will finally be decided by the community of the customers and not by legislators who probably restrict both sides of the market in a way which is less efficient. In particular redistribute legislation of property rights between owners of IPRs on digital music files on the one hand and consumers with traditional fairuse rights on the other could be avoided.

Markets as institutions could work probably better under such a Coasian regime of a liberal market order than one with direct state intervention and more restrictive rulings.